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EXPLANATION OF PLATE 1161

Fig. 1. *C. FARINACEA*, Southington, Connecticut, *J. M. Bunn*, 1945, No. 6447. Fig. 2. *C. FARINACEA*, Punta Arenas, Patagonia, *P. Hariot*, 1882 (?), No. 15667, type of *C. furcata* γ. *scabriuscula* f. *farinacea* Vainio. Fig. 3. *C. CYLINDRICA*, Southington, *J. M. Bunn*, 1945, No. 6450. All $\times 1\frac{1}{2}$. The writer wishes to thank Dr. John R. Reeder for the photographs used in the preparation of this plate.

A SUBSTITUTE FOR FORMALDEHYDE AND ALCOHOL IN PLANT COLLECTING

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WHILE preparing for three months of field work in Mexico during the fall of 1949, I was referred by Dr. George H. M. Lawrence of the Bailey Hortorium to a note by Swingle (Bot. Gaz. **90**: 333–34, 1930) concerning the use of water soluble oxyquinoline sulphate (now sold as hydroxyquinoline sulphate) as a field preservative for plants on the Humbert-Swingle Madagascar plant exploration trip of 1928. The agent was described as a practically non-poisonous, non-corrosive disinfectant with high antiseptic and preservative properties but low germicidal action. It lacks the disagreeable pungent odor and the drying action on the skin of formaldehyde and is transportable in powder form, thereby eliminating the bulk of either alcohol or formaldehyde.

Schultes has discussed the use of formaldehyde (RHODORA **49**: 54–60, 1947) and Hodge of alcohol (op. cit. 207–210) by the plant collector in the field but apparently the suitability of hydroxyquinoline sulphate has been overlooked. Previous struggles with the discomfort of acrid fumes and rough dry hands and the inconvenience of transport attendant on the use of formaldehyde in the technique described made the substitution of a convenient and satisfactory chemical in powder form seem worth further trial. Consequently a stock of packets was made, each containing 10 grams of the material or sufficient to make a quart or liter of

approximately 1 per cent solution upon addition to water. Swingle noted that as low as a 0.1 per cent solution is satisfactory for stopping bacterial action with ordinary plant material and 0.5 per cent solutions have been used for preserving study material in liquid at the Bailey Hortorium but the stronger concentration was thought safer for field trial.

Unfortunately for a general testing, most collecting was done in areas where presses could be placed over heat at night but a sample bundle of one day's collecting was treated with a 1 per cent aqueous solution of hydroxyquinoline sulphate, sealed and carried for a week before putting into press. The method used was essentially that described by Schultes, substituting the present agent for formaldehyde, and the results were most satisfactory. The solution has a slight but not unpleasant odor and had little effect on the skin during trial so that working with bare hands is feasible.

In addition to the treating of specimens, palm fruits and flowers were preserved in vials or jars using the same concentration and after three months have shown no sign of deterioration. Study material previously mentioned, consisting of flowers and fruits collected fresh and placed in solution during the summer months of 1949, was in satisfactory condition for laboratory work in the winter months, suggesting a broad applicability. However, Swingle's warning that a precipitate is formed when the solution comes in contact with ferrous metals must be repeated. A plastic, cork or other non-metallic capping for jar or vial eliminates such difficulty.

It is suggested that hydroxyquinoline sulphate be given further consideration and trial for it thus far upholds Swingle's recommendation of it as a most acceptable general preservative for use of the plant collector. Because of the low cost, ease of transport as a dry powder, rapidity of preparation with water and apparent lasting quality as a preservative it appears to be an ideal substitute for formaldehyde and alcohol where these are now used by the collector and its use eliminates obnoxious fumes, drying and cracking skin and wasteful disposal of potable alcohol.

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